



Spring 2009 CIS Colloquium Series

# Program Visualization and Alice: Past, Present and a Look into the Future

**Steve Cooper**  
(St. Joseph's University)

*Monday, April 6, 2009*

**Abstract:** A program visualization tool, Alice ([www.alice.org](http://www.alice.org)), has been used as the basis for the creation of an innovative curriculum for teaching introductory computing courses. In Alice, students build 3-D animated movies and 3-D interactive games as they learn to program. Alice has been used in both traditional four-year institutions and community colleges to increase the comprehension of basic computer science topics of novice programmers.

The Alice programming environment allows students to create programs using a "drag-and-drop" editor. Since the Alice software only allows syntactically valid commands, programming is reduced to the development and implementation of appropriate algorithms, an essential programming skill regardless of language. Further, the Alice software allows students to test their algorithms visually. Objects are viewed on screen and may be programmed to move and interact. Students can test their programs by viewing the on-screen changes. The Alice curriculum is designed to exploit these features of the Alice software for the purpose of learning to program.

In this talk, we will briefly discuss the background of the problem, the nationwide decline of computing students, and then describe the aspects of our curricular solution with Alice. Results of some NSF-funded studies will be presented. The next version of Alice, Alice 3.0, will be discussed and presented. Alice 3.0 has two major advantages over Alice 2.0: 1) the quality of the objects is better, and objects have a higher level of primitives, and 2) students are able to build Alice worlds by typing Java code.

**Bio:** Steve Cooper is an Associate Professor of Computer Science at Saint Joseph's University and the Director of its Center for Visualization. His research areas lie in program visualization and semantics. He has been working with Alice and developing Alice-related curricular materials since 1998. Along with Wanda Dann and the late Randy Pausch, he has written many technical papers on Alice, as well as two texts, *Learning to Program with Alice* (2006, Prentice-Hall) and *Exploring Wonderland* (2009, Prentice-Hall). The latter text, which includes Barbara Ericson as a co-author, integrates Alice and Media Computation into a single CS1 course. Steve is currently serving a two year assignment in NSF's Division of Undergraduate Education, within its Education and Human Resources Directorate. There, he works as a program manager, and is responsible for the CCLI, ATE, SFS, and S-STEM programs.

*Location: 4<sup>th</sup> Floor Conference Room (Wachman 447)*

*Time: 11am-12pm, Monday, April 6, 2009*

*Refreshments will be served!*